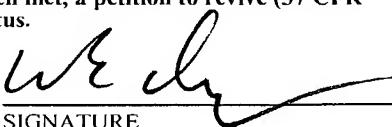


| | | | | |
|---|--|---|--|--|
| FORM PTO-1390 (Modified) (REV 11-2000) | | U.S. DEPARTMENT OF COMMERCE PATENT AND TRADEMARK OFFICE | | ATTORNEY'S DOCKET NUMBER |
| TRANSMITTAL LETTER TO THE UNITED STATES DESIGNATED/ELECTED OFFICE (DO/EO/US) CONCERNING A FILING UNDER 35 U.S.C. 371 | | | | 112740-385 |
| INTERNATIONAL APPLICATION NO PCT/DE00/01174 | | INTERNATIONAL FILING DATE 14 April 2000 | | U.S. APPLICATION NO (IF KNOWN, SEE 37 CFR 10/019524 |
| TITLE OF INVENTION METHOD OF OPERATING A MOBILE TERMINAL AND CORRESPONDING MOBILE RADIO SYSTEM | | PRIORITY DATE CLAIMED 28 June 1999 | | |
| APPLICANT(S) FOR DO/EO/US Joerg Siewerth et al. | | | | |
| Applicant herewith submits to the United States Designated/Elected Office (DO/EO/US) the following items and other information | | | | |
| <ol style="list-style-type: none"> 1. <input checked="" type="checkbox"/> This is a FIRST submission of items concerning a filing under 35 U.S.C. 371. 2. <input type="checkbox"/> This is a SECOND or SUBSEQUENT submission of items concerning a filing under 35 U.S.C. 371. 3. <input checked="" type="checkbox"/> This is an express request to begin national examination procedures (35 U.S.C. 371(f)). The submission must include items (5), (6), (9) and (24) indicated below. 4. <input checked="" type="checkbox"/> The US has been elected by the expiration of 19 months from the priority date (Article 31). 5. <input checked="" type="checkbox"/> A copy of the International Application as filed (35 U.S.C. 371 (c) (2)) <ol style="list-style-type: none"> a. <input checked="" type="checkbox"/> is attached hereto (required only if not communicated by the International Bureau) b. <input type="checkbox"/> has been communicated by the International Bureau. c. <input type="checkbox"/> is not required, as the application was filed in the United States Receiving Office (RO/US) 6. <input checked="" type="checkbox"/> An English language translation of the International Application as filed (35 U.S.C. 371(c)(2)) <ol style="list-style-type: none"> a. <input checked="" type="checkbox"/> is attached hereto. b. <input type="checkbox"/> has been previously submitted under 35 U.S.C. 154(d)(4). 7. <input checked="" type="checkbox"/> Amendments to the claims of the International Application under PCT Article 19 (35 U.S.C. 371 (c)(3)) <ol style="list-style-type: none"> a. <input type="checkbox"/> are attached hereto (required only if not communicated by the International Bureau). b. <input checked="" type="checkbox"/> have been communicated by the International Bureau. c. <input type="checkbox"/> have not been made; however, the time limit for making such amendments has NOT expired. d. <input type="checkbox"/> have not been made and will not be made. 8. <input checked="" type="checkbox"/> An English language translation of the amendments to the claims under PCT Article 19 (35 U.S.C. 371(c)(3)). 9. <input checked="" type="checkbox"/> An oath or declaration of the inventor(s) (35 U.S.C. 371 (c)(4)). 10. <input type="checkbox"/> An English language translation of the annexes to the International Preliminary Examination Report under PCT Article 36 (35 U.S.C. 371 (c)(5)). 11. <input checked="" type="checkbox"/> A copy of the International Preliminary Examination Report (PCT/IPEA/409). 12. <input checked="" type="checkbox"/> A copy of the International Search Report (PCT/ISA/210). | | | | |
| Items 13 to 20 below concern document(s) or information included: <ol style="list-style-type: none"> 13. <input checked="" type="checkbox"/> An Information Disclosure Statement under 37 CFR 1.97 and 1.98 14. <input checked="" type="checkbox"/> An assignment document for recording. A separate cover sheet in compliance with 37 CFR 3.28 and 3.31 is included. 15. <input checked="" type="checkbox"/> A FIRST preliminary amendment 16. <input type="checkbox"/> A SECOND or SUBSEQUENT preliminary amendment. 17. <input checked="" type="checkbox"/> A substitute specification. 18. <input type="checkbox"/> A change of power of attorney and/or address letter 19. <input type="checkbox"/> A computer-readable form of the sequence listing in accordance with PCT Rule 13ter 2 and 35 U.S.C. 1.821 - 1.825. 20. <input type="checkbox"/> A second copy of the published international application under 35 U.S.C. 154(d)(4). 21. <input type="checkbox"/> A second copy of the English language translation of the international application under 35 U.S.C. 154(d)(4). 22. <input checked="" type="checkbox"/> Certificate of Mailing by Express Mail 23. <input type="checkbox"/> Other items or information | | | | |

| U.S. APPLICATION NO. (IF KNOWN, SEE 37 CFR 10/019524 | INTERNATIONAL APPLICATION NO PCT/DE00/01174 | ATTORNEY'S DOCKET NUMBER 112740-385 | | | | | | | | | | | | | | | | |
|--|---|--|-------------------------|--------------|------|--------------|-----------|---|-------------------------|--------------------|---------|---|-------------------------|--|--|--------------------------|---------------|--|
| 24. The following fees are submitted: | | CALCULATIONS PTO USE ONLY | | | | | | | | | | | | | | | | |
| BASIC NATIONAL FEE (37 CFR 1.492 (a) (1) - (5)) : | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> Neither international preliminary examination fee (37 CFR 1.482) nor international search fee (37 CFR 1.445(a)(2)) paid to USPTO and International Search Report not prepared by the EPO or JPO \$1040.00 | | | | | | | | | | | | | | | | | | |
| <input checked="" type="checkbox"/> International preliminary examination fee (37 CFR 1.482) not paid to USPTO but International Search Report prepared by the EPO or JPO \$890.00 | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> International preliminary examination fee (37 CFR 1.482) not paid to USPTO but international search fee (37 CFR 1.445(a)(2)) paid to USPTO \$740.00 | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> International preliminary examination fee (37 CFR 1.482) paid to USPTO but all claims did not satisfy provisions of PCT Article 33(1)-(4) \$710.00 | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> International preliminary examination fee (37 CFR 1.482) paid to USPTO and all claims satisfied provisions of PCT Article 33(1)-(4) \$100.00 | | | | | | | | | | | | | | | | | | |
| ENTER APPROPRIATE BASIC FEE AMOUNT = | | \$890.00 | | | | | | | | | | | | | | | | |
| Surcharge of \$130.00 for furnishing the oath or declaration later than months from the earliest claimed priority date (37 CFR 1.492 (e)). | | <input type="checkbox"/> 20 <input type="checkbox"/> 30 \$0.00 | | | | | | | | | | | | | | | | |
| <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>CLAIMS</th> <th>NUMBER FILED</th> <th>NUMBER EXTRA</th> <th>RATE</th> </tr> </thead> <tbody> <tr> <td>Total claims</td> <td>16 - 20 =</td> <td>0</td> <td>x \$18.00 \$0.00</td> </tr> <tr> <td>Independent claims</td> <td>2 - 3 =</td> <td>0</td> <td>x \$84.00 \$0.00</td> </tr> <tr> <td colspan="2">Multiple Dependent Claims (check if applicable).</td> <td><input type="checkbox"/></td> <td>\$0.00</td> </tr> </tbody> </table> | | CLAIMS | NUMBER FILED | NUMBER EXTRA | RATE | Total claims | 16 - 20 = | 0 | x \$18.00 \$0.00 | Independent claims | 2 - 3 = | 0 | x \$84.00 \$0.00 | Multiple Dependent Claims (check if applicable). | | <input type="checkbox"/> | \$0.00 | |
| CLAIMS | NUMBER FILED | NUMBER EXTRA | RATE | | | | | | | | | | | | | | | |
| Total claims | 16 - 20 = | 0 | x \$18.00 \$0.00 | | | | | | | | | | | | | | | |
| Independent claims | 2 - 3 = | 0 | x \$84.00 \$0.00 | | | | | | | | | | | | | | | |
| Multiple Dependent Claims (check if applicable). | | <input type="checkbox"/> | \$0.00 | | | | | | | | | | | | | | | |
| TOTAL OF ABOVE CALCULATIONS = | | \$890.00 | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> Applicant claims small entity status See 37 CFR 1.27). The fees indicated above are reduced by 1/2. | | \$0.00 | | | | | | | | | | | | | | | | |
| SUBTOTAL = | | \$890.00 | | | | | | | | | | | | | | | | |
| Processing fee of \$130.00 for furnishing the English translation later than months from the earliest claimed priority date (37 CFR 1.492 (f)) | | <input type="checkbox"/> 20 <input type="checkbox"/> 30 + \$0.00 | | | | | | | | | | | | | | | | |
| TOTAL NATIONAL FEE = | | \$890.00 | | | | | | | | | | | | | | | | |
| Fee for recording the enclosed assignment (37 CFR 1.21(h)). The assignment must be accompanied by an appropriate cover sheet (37 CFR 3.28, 3.31) (check if applicable). | | <input type="checkbox"/> \$0.00 | | | | | | | | | | | | | | | | |
| TOTAL FEES ENCLOSED = | | \$890.00 | | | | | | | | | | | | | | | | |
| | | Amount to be: refunded \$ | | | | | | | | | | | | | | | | |
| | | charged \$ | | | | | | | | | | | | | | | | |
| a. <input checked="" type="checkbox"/> A check in the amount of <u>\$890.00</u> to cover the above fees is enclosed. b. <input type="checkbox"/> Please charge my Deposit Account No. _____ in the amount of _____ to cover the above fees A duplicate copy of this sheet is enclosed c. <input checked="" type="checkbox"/> The Commissioner is hereby authorized to charge any additional fees which may be required, or credit any overpayment to Deposit Account No. <u>02-1818</u> A duplicate copy of this sheet is enclosed. d. <input type="checkbox"/> Fees are to be charged to a credit card. WARNING: Information on this form may become public. Credit card information should not be included on this form. Provide credit card information and authorization on PTO-2038. | | | | | | | | | | | | | | | | | | |
| NOTE: Where an appropriate time limit under 37 CFR 1.494 or 1.495 has not been met, a petition to revive (37 CFR 1.137(a) or (b)) must be filed and granted to restore the application to pending status. | | | | | | | | | | | | | | | | | | |
| SEND ALL CORRESPONDENCE TO: | | | | | | | | | | | | | | | | | | |
| William E. Vaughan (Reg. No. 39,056) Bell, Boyd & Lloyd LLC P.O. Box 1135 Chicago, Illinois 60690-1135 | | | | | | | | | | | | | | | | | | |
|  SIGNATURE William E. Vaughan NAME 39,056 REGISTRATION NUMBER December 27, 2001 DATE | | | | | | | | | | | | | | | | | | |

BOX PCT

IN THE UNITED STATES ELECTED/DESIGNATED OFFICE
OF THE UNITED STATES PATENT AND TRADEMARK OFFICE
UNDER THE PATENT COOPERATION TREATY-CHAPTER II

5

PRELIMINARY AMENDMENT

APPLICANT: Joerg Siewerth et al. DOCKET NO: 112740-385
SERIAL NO: GROUP ART UNIT:
INTERNATIONAL APPLICATION NO: PCT/DE00/01174
10 INTERNATIONAL FILING DATE: 14 April 2000
INVENTION: METHOD OF OPERATING A MOBILE TERMINAL AND
CORRESPONDING MOBILE RADIO SYSTEM

15 Assistant Commissioner for Patents,
Washington, D.C. 20231

Sir:

Please amend the above-identified International Application before entry
into the National stage before the U.S. Patent and Trademark Office under 35

20 U.S.C. §371 as follows:

In the Specification:

Please replace the Specification of the present application, including the
Abstract, with the following Substitute Specification:

S P E C I F I C A T I O N

25

TITLE OF THE INVENTION

METHOD OF OPERATING A MOBILE TERMINAL
AND CORRESPONDING MOBILE RADIO SYSTEM

BACKGROUND OF THE INVENTION

30 The present invention relates to a method for operating a mobile terminal, in
particular a mobile phone, in a mobile radio system, and to a corresponding mobile
radio system.

The mobile phone has become a constant companion for many people, the essential advantage of mobile phones being that the respective mobile phone subscriber can be reached at any time.

However, being reachable at all times also has its disadvantages. In many 5 locations in a mobile radio network the use of mobile phones is not desired. For example, the use of a mobile phones in concert halls, cinemas, churches, restaurants, etc., is undesired; in particular, the signaling sounds generated by the mobile phones when incoming calls are received are considered to be a nuisance. In other areas, for example in aircraft or hospitals, the use of mobile phones is even 10 forbidden owing to the disadvantageous influence on the high-frequency-sensitive electronics. For this reason, mobile radio subscribers are requested verbally or via signs not to use their mobile phones in the corresponding areas. In some cases, the use of mobile phones is also forbidden by law.

However, for such provisions to be effective, it must be possible to rely on 15 the decency and reliability of mobile radio subscribers or owners of mobile phones. However, because mobile phone subscribers are frequently lacking in the necessary considerateness, possible ways for automatically protecting specific locations against the disruptive use of the mobile phones have already been developed. For example, it is known to install jamming transmitters which intentionally prevent 20 calls being enabled with mobile phones in a specific area, for which purpose the jamming transmitters superimpose signals on the signals of incoming and outgoing calls. Furthermore, devices are also known which change the radio transmit power of the base stations of the mobile radio network within a specific range, thus preventing contact or a connection setup between the mobile phones and the base 25 station. Finally, it is also known to install small transmitters at the entrances to rooms in which the use of mobile phones is to be prevented, which transmitters switch off any mobile phone by remote control using a corresponding radio signal when the subscriber passes the transmitter. When the subscriber leaves such rooms, the mobile phones are then switched on again by the transmitter.

30 However, mobile phone network operators are obliged to provide a mobile radio network with an area coverage that is as comprehensive as possible. This is

thus restricted by the measures described above, such that the legal acceptability of such measures or devices is currently still under debate. In addition, the possible negative effects of such measures on technical and electronic devices is not yet clear.

5 The present invention is, therefore, directed toward proposing an alternative method for operating mobile terminals and a corresponding mobile radio system, it being possible to reliably control the use or non-use of mobile phones within the mobile radio system.

SUMMARY OF THE INVENTION

10 The present invention defines chronological and/or spatial non-use ranges which are monitored within the mobile radio system. The spatial non-use ranges can be defined both by the mobile radio subscriber himself/herself and by a corresponding point which has the non-use range. In contrast, chronological non-use ranges are generally prescribed only by the corresponding mobile radio 15 subscriber, it being possible to connect these chronological non-use ranges, in particular, to the organizer of the mobile radio subscriber.

20 In order to monitor spatial non-use ranges, corresponding monitoring measures are provided which sense the position of the corresponding mobile terminal, for example of a mobile phone, within the mobile radio network. These monitoring measures can be connected, for example, to the GPS (Global Positioning System) system and thus permit positions to be determined by satellite. Likewise, the position of any mobile terminal can be determined in relation to the known geographic position of three base stations or via cell identifiers (Cell Ids) 25 using a triangulation method.

25 If it is detected within the mobile radio system, via time monitoring or position monitoring of the mobile terminal, that one of the predefined non-use ranges has been reached, a corresponding non-use action, which is intended to ensure non-use of the respective mobile terminal, is automatically initiated. This action can be, for example, the automatic transmission of a message (for example, 30 of an SMS (Short Message Services)) to the mobile terminal, the activation of an automatic call forwarding facility or automatic switching off of the mobile

terminal. It is recommended here to adapt the “severity” of the respectively selected action to the instantaneous distance from the respective non-use range, so that a mobile phone is, for example, forcibly switched off automatically only if the mobile phone is less than 10 m away from the corresponding non-use range.

5 The present invention thus permits both the passive request and an active request, i.e. self-selected by the mobile radio subscriber, for the non-use of the mobile terminal as a function of the instantaneous geographic position and/or time. The control of the non-use facility is always carried out within the respective mobile radio system in that corresponding measures are taken at the mobile 10 terminal itself or via the network operator; i.e., no external or additional transmitters are provided and are thus not necessary either. In particular, the maintenance of a mobile radio system with comprehensive area coverage is ensured because, for example, the transmission power of the base station, etc., is not manipulated. Moreover, the “degree of severity” of the request not to use the 15 mobile terminal can be adapted to the urgency of such a measure.

Additional features and advantages of the present invention are described in, and will be apparent from, the following Detailed Description of the Invention and the Figures.

BRIEF DESCRIPTION OF THE FIGURES

20 Fig. 1 shows a preferred block circuit diagram of an exemplary embodiment of the mobile radio system of the present invention.

Fig. 2 shows a flowchart of an exemplary embodiment of a method according to the present invention which can be applied in the mobile radio system shown in Fig. 1.

25 DETAILED DESCRIPTION OF THE INVENTION

Fig. 1 shows, in a way which is representative of a mobile radio system, a base station 1 and a mobile phone 2 which communicates with the latter over a mobile radio channel 5. Modern mobile radio networks generally have a cellular structure, each radio cell being assigned a base station 1 which is responsible for 30 the mobile phones 2 which are located within this radio cell at any given moment, and additionally serves as an interface to the telephone fixed network so that not

only calls between different mobile phones 2 but also between a mobile phone 2 and a fixed network terminal (not shown) can be made.

A mobile radio system includes a memory 4 in which chronological and/or spatial non-use ranges are stored for each mobile radio subscriber or mobile phone.

5 These ranges are time periods or geographic ranges in which use of the corresponding mobile phone 2 is not desired.

These non-use ranges can be determined by each mobile radio subscriber himself/herself. This can be made, for example, via an appropriate entry at the mobile phone 2 with subsequent transmission of the data to the network operator or

10 the base station 1 or by signaling to the network operator or the service provider. When the information relating to the non-use ranges is transmitted to the service provider, the latter collects the information relating to the non-use ranges of all the mobile phones 2 for which it is responsible and passes it on to the network operator 1 or to the individual base stations 1 of the mobile radio network. Likewise, it is 15 possible for specific geographic locations, for example hospitals, etc., in which use of mobile phones is not desired, to be defined to the service provider or network operator as non-use ranges by the locations themselves. For this purpose, such locations must also signal their geographic data to the network operator or service provider in order to be able to be subsequently monitored.

20 As has already been mentioned, the non-use ranges can be seen not only in spatial but also in chronological terms. For example, a mobile radio subscriber may be interested in receiving no calls between 8.00 p.m. and 10.00 p.m. In such a situation it is appropriate for the mobile radio subscriber to have an automatic adjustment facility for these chronological non-use ranges on his/her organizers, so
25 that the mobile radio subscriber cannot be disturbed by the calls during important meetings, for example.

While the monitoring of the chronological non-use ranges can be carried out relatively easily via a time measuring device, the monitoring of spatial non-use ranges is more complex because, to do this, the position of the mobile phone 2 always has to be sensed. For this purpose, according to Fig. 1, a corresponding device 3 is provided which senses the instantaneous position of the mobile phone 2

with sufficient precision. The device 3 can be coupled, for example, to a GPS (Global Positioning System) system, by which corresponding information relating to the positions of the individual mobile phones 2 is supplied in the form of their geographic longitude and latitude. It is also conceivable for the device 3 to

5 determine the position of the mobile phone 2 with respect to known geographic reference points. For example, the position of the mobile phone 2 within the mobile radio network can be determined using a triangulation method with respect to the known position of three base stations 1 if, for example, the propagation time differences of a signal transmitted by the mobile phone 2 are evaluated with respect

10 to the three base stations 1.

The non-use ranges stored in the memory 4 are monitored by a controller 6 with reference to the position data supplied by the device 3 and the instantaneous time data, in order to determine a possible collision and, if appropriate, initiate a corresponding measure. If the owner of a mobile phone moves, for example, into

15 the vicinity of a predefined non-use range, for example into the vicinity of a hospital or if he/she is less than a specific minimum distance away from this non-use range, he/she is requested by the controller 6 not to use the mobile phone 2. For such a “request”, various measures are conceivable. In the simplest case, only an appropriate message, which can be in the form of a SMS message or via a call

20 with an automatic announcement, is automatically transmitted to the mobile unit 2. Likewise, it is possible to activate an automatic call forwarding facility which ensures that incoming calls for the mobile phone 2 are automatically forwarded to another, assigned receiver; in particular, to a voicemail box or to a telephone answering machine. Furthermore it is conceivable, when a non-use range is

25 reached, to replace the ringing of the mobile phone 2, in the event of a call, by vibration, for which purpose corresponding mechanisms are already known. As a result, at least the suppression of disruptive ringing noises is avoided. Moreover, the user can be signaled optically, for example by flashing of his/her radio clock etc., which also requires him/her to switch off the mobile phone 2. Finally, in the

30 most extreme case, the mobile phone 2 can be switched off automatically by the mobile phone itself or via the network operator, in which case it should be ensured,

however, that an emergency call is still possible. In all cases, the measure taken is preferably cancelled again after the subscriber leaves the non-use range, so that unrestricted use of the mobile phone 2 is always possible outside the desired or predefined non-use ranges.

5 In order to avoid confusing the user, it is recommended that the owner of the mobile phone 2 is always informed of the current state of his/her device, which can be carried out, in particular, via an appropriate screen display (for example, "You are currently in a non-use range and your unit has been switched off"), so that the user can distinguish, in particular between automatic switching off when the
10 non-use range is reached and an area of no radio coverage or a time when his mobile phone 2 is defective or the battery is exhausted.

15 In principle it is also conceivable to configure the control device 6 in the form of what is referred to as a short range communication device which initiates respectively necessary action for the non-use of the mobile phone 2 via an additional control signal or information signal transmitted to the mobile phone 2. In order to avoid influencing the actual mobile radio network, this control information or information signal is transmitted here on a different wavelength from that of the actual mobile radio communication signal. This control signal or information signal thus can, for example, be transmitted in a GSM mobile radio
20 network in the form of a blue tooth signal or infrared signal and evaluated in the mobile phone 2 by a correspondingly configured receiver.

25 In the example shown in Fig. 1, the devices 3, 4 and 6 are coupled to the base station 1 or assigned to the network operator. However, it is, of course, also conceivable for these units to be integrated into the mobile phone 2, in which case the memory 4 only stores the non-unit areas of the corresponding mobile phone 2. Furthermore, in this case, each mobile phone 2 can automatically determine its geographic position via a device 3 by virtue of the fact that the device 3 is configured, for example, as a GPS transceiver unit or evaluates, in terms of its propagation time differences, a signal which is emitted simultaneously by three
30 base stations 1 with known geographic positions. When the devices 3, 4 and 6 are integrated into the mobile phone 2, the controller 6 can then directly initiate the

corresponding action for the non-use of the mobile phone on the same mobile phone 2.

It is particularly advantageous if the “severity” of the measure or action to be taken is adapted to the necessary urgency of the non-use of the mobile phone 2.

5 This will be explained in more detail below with reference to flowcharts shown in Fig. 2.

As has already been explained, the chronological and/or spatial non-use ranges are firstly defined by the owner of the mobile phone himself/herself or by a corresponding location and this information is collected (Step S100). Whether 10 these predefined non-use ranges are reached is then monitored (S101) automatically and continuously and a check is made to determine whether there is a collision between the instantaneous time and the chronological non-use ranges or the instantaneous position of the mobile phone and the spatial non-use ranges (S102). This can be done, for example, by monitoring a relatively widely formulated 15 limiting value for the time period between the instantaneous time and the individual chronological non-use ranges or the distance between the instantaneous position of the mobile phone and the individual spatial non-use ranges. If there is no risk of a collision, it is ensured that unrestricted use of the mobile phone is possible. If 20 measures for the non-use of the mobile phone have previously been taken, they are cancelled again in this case (S103).

If, on the other hand, there is the risk of a collision with the predefined non-use ranges, a very tightly selected limiting value for the distance between the instantaneous time and the chronological non-use ranges or the instantaneous position and the spatial non-use ranges is firstly checked (S104). If there is, for 25 example, only a time period of 10s between the instantaneous time and one of the chronological non-use ranges or only a distance of 10m between the instantaneous position of the mobile phone and a spatial non-use range, a measure must be taken which reliably ensures that the mobile phone is used in the corresponding non-use range; i.e., forcible switching off of the mobile phone must be carried out (S108) 30 which is not reversed again during the Step S103 until it is sensed that the subscriber leaves the non-use range (S102). In a further Step S105, a further

limiting value is monitored, which corresponds to a lower level of urgency with respect to the limiting value monitored in Step S104. In the example shown in Fig. 2, it is checked here whether the time period between the instantaneous time and the chronological non-use ranges is shorter than 50s, or the distance between the 5 instantaneous position of the mobile phone and the spatial non-use ranges is less than 50m. If this is the case, an automatic call divert, for example to a voicemail box of the corresponding mobile radio subscriber, is activated (S107). If these limiting values are not fulfilled either, a relatively “harmless” measure is taken which has the purpose of merely requesting the mobile radio subscriber not to use 10 his/her mobile phone, this measure providing, for example, the transmission of a corresponding SMS message to the mobile phone (S106). The measures as taken in Steps S106 and S107 are also not reversed in the Step S103 until it has been determined in Step S102 that there is no longer the risk of a collision with the predefined non-use ranges.

15 Although the present invention has been described with reference to specific embodiments, those of skill in the art will recognize that changes may be made thereto without departing from the spirit and scope of the invention as set forth in the hereafter appended claims.

ABSTRACT OF THE DISCLOSURE

A method for operating a mobile terminal and corresponding mobile radio system, wherein chronological and/or spatial non-use ranges in which use of the mobile phone is not desired are defined for the mobile phone. The mobile radio system continues to monitor whether the non-use ranges have been reached and, if appropriate, initiates an action for the non-use of the mobile phone. In the simplest case, a switch-off request is issued, and in the most extreme case automatic switching off of the mobile phone occurs. In the case of spatial non-use ranges, the mobile radio system continuously monitors the position of the mobile phone within the mobile radio system.

In the claims:

On page 12, cancel line 1, and substitute the following left-hand justified heading therefor:

5 **CLAIMS**

Please cancel claims 1-17, without prejudice, and substitute the following claims therefor:

18. A method for operating a mobile terminal in a mobile radio system, the method comprising the steps of:

10 defining at least one non-use range in which use of the mobile terminal is not desired, the non-use range being a chronological period;

 monitoring within the mobile radio system whether the non-use range is reached; and

15 initiating an action with the mobile radio system if the non-use range has been reached, the action being initiated independently of a current location of the mobile terminal.

19. A method for operating a mobile terminal in a mobile radio system as claimed in claim 18, the method further comprising the steps of:

20 defining the non-use range by a subscriber to the mobile radio system who is assigned to the mobile terminal; and

 signaling, via the subscriber, the non-use range to one of the mobile radio system and a corresponding mobile radio service provider.

25 20. A method for operating a mobile terminal in a mobile radio system as claimed in claim 18, the method further comprising the step of:

 transmitting a message, to the mobile terminal which requests a subscriber assigned to the mobile terminal to switch off the mobile terminal, automatically as an action for the non-use of the mobile terminal in the mobile radio system.

21. A method for operating a mobile terminal in a mobile radio system as claimed in claim 20, wherein the message is transmitted to the mobile terminal in the form of a short message, the short message being represented on a display of the mobile terminal.

5

22. A method for operating a mobile terminal in a mobile radio system as claimed in claim 20, wherein the message is transmitted in the form of a call to the mobile terminal.

10

23. A method for operating a mobile terminal in a mobile radio system as claimed in claim 18, the method further comprising the step of:

actuating a call forwarding facility, which automatically forwards calls for the mobile terminal to a receiver assigned to the mobile terminal, in the mobile radio system at an action for the non-use of the mobile terminal.

15

24. A method for operating a mobile terminal in a mobile radio system as claimed in claim 18, the method further comprising the step of:

using signaling of a call to the mobile terminal as an action for the non-use of the mobile terminal.

20

25. A method for operating a mobile terminal in a mobile radio system as claimed in claim 18, the method further comprising the step of:

transmitting an appropriate optical signal from the mobile radio system to a subscriber to the mobile radio system, who is assigned to the mobile terminal, as an action for the non-use of the mobile terminal .

25

26. A method for operating a mobile terminal in a mobile radio system as claimed in claim 18, the method further comprising the step of:

30 deactivating, automatically, the mobile terminal within the mobile radio system as an action for the non-use of the mobile terminal.

27. A method for operating a mobile terminal in a mobile radio system as claimed in claim 18, the method further comprising the step of:

selecting and initiating, automatically, a specific action of a plurality of available actions for the non-use of the mobile terminal as a function of an instantaneous distance from the non-use range, a severity of the selected action increasing as a distance from the non-use range decreases.

28. A method for operating a mobile terminal in a mobile radio system as claimed in claim 18, the method further comprising the step of:

10 displaying, automatically, on a display of the mobile terminal a corresponding message which provides information on the instantaneous operating state of the mobile terminal after the initiation of an action for the non-use of the mobile terminal.

15 29. A method for operating a mobile terminal in a mobile radio system
as claimed in claim 18, the method further comprising the step of:

reversing the initiated action for the non-use of the mobile terminal if the mobile terminal leaves the non-use range again.

20 30. A mobile radio system, comprising:

at least one base station;

at least one mobile terminal;

a mobile radio channel via which communication between the at least one base station and the at least one mobile terminal is transmitted, at least one non-use range being defined in which use of the mobile terminal is not desired; and

control parts for monitoring whether the non-use range is reached, the control parts configured such that an action for non-use of the mobile terminal is initiated if the non-use range has been reached, a chronological period being defined as the non-use range, and an action for the non-use of the mobile terminal being initiated independently of a current location of the mobile terminal if the non-use range has been reached.

31. A mobile radio system as claimed in claim 30, wherein the control parts are assigned to the base station of the mobile radio system.

5 32. A mobile radio system as claimed in claim 30, wherein the control parts are integrated into the mobile terminal.

33. A mobile radio system as claimed in claim 30, wherein the control parts are assigned to a mobile radio service provider.

10

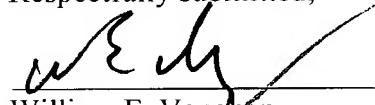
R E M A R K S

The present amendment makes editorial changes and corrects typographical errors in the specification, which includes the Abstract, in order to conform the specification to the requirements of United States Patent Practice. No new matter 15 is added thereby. Attached hereto is a marked-up version of the changes made to the specification by the present amendment. The attached page is captioned “**Version With Markings To Show Changes Made**”.

In addition, the present amendment cancels original claims 1-17 in favor of new claims 18-33. Claims 18-33 have been presented solely because the revisions 20 by crossing out and underlining which would have been necessary in claims 1-17 in order to present those claims in accordance with preferred United States Patent Practice would have been too extensive, and thus would have been too burdensome. The present amendment is intended for clarification purposes only and not for substantial reasons related to patentability pursuant to 35 U.S.C. §§103, 25 102, 103 or 112. Indeed, the cancellation of claims 1-17 does not constitute an intent on the part of the Applicants to surrender any of the subject matter of claims 1-17.

Early consideration on the merits is respectfully requested.

Respectfully submitted,


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Version With Markings To Show Changes Made

S P E C I F I C A T I O N

TITLE OF THE INVENTION

Description

5 **METHOD OF OPERATING A MOBILE TERMINAL
AND CORRESPONDING MOBILE RADIO SYSTEM**

BACKGROUND OF THE INVENTION

The present invention relates to a method for operating a mobile terminal, in particular a mobile phone, in a mobile radio system, and to a corresponding mobile 10 radio system.

The mobile phone has become a constant companion for many people, the essential advantage of mobile phones being that the respective mobile phone subscriber can be reached at any time.

However, being reachable at all times also has its disadvantages. In many 15 locations in a mobile radio network the use of mobile phones is not desired. Thus, for For example, the use of a mobile phones in concert halls, cinemas, churches, restaurants, etc., is undesired; in particular, the signaling sounds generated by the mobile phones when incoming calls are received being are considered to be a nuisance. In other areas, for example in aircraft or hospitals, the use of mobile 20 phones is even forbidden owing to the disadvantageous influence on the high-frequency—sensitive frequency-sensitive electronics. For this reason, mobile radio subscribers are requested verbally or by means of via signs not to use their mobile phones in the corresponding areas. In some cases, the use of mobile phones is also forbidden by law.

25 However, for such provisions to be effective, it must be possible to rely on the decency and reliability of mobile radio subscribers or owners of mobile phones. However, because mobile phone subscribers are frequently lacking in the necessary considerateness, possible ways for automatically protecting specific locations against the disruptive use of the mobile phones have already been developed. For 30 example, it is known to install jamming transmitters which intentionally prevent calls being made enabled with mobile phones in a specific area, for which purpose

the jamming transmitters superimpose signals on the signals of incoming and outgoing calls. Furthermore, devices are also known which change the radio transmit power of the base stations of the mobile radio network within a specific range, thus preventing contact or a connection setup between the mobile phones
5 and the base station. Finally, it is also known to install small transmitters at the entrances to rooms in which the use of mobile phones is to be prevented, which transmitters switch off any mobile phone by remote control using a corresponding radio signal when the subscriber passes the transmitter. When the subscriber leaves such rooms, the mobile phones are then switched on again by the transmitter.

10 However, mobile phone network operators are obliged to provide a mobile radio network with an area coverage that is as comprehensive as possible, ~~but this~~.
This is thus restricted by the measures described above; so, such that the legal acceptability of such measures or devices is currently still under debate. In addition, the possible negative effects of such measures on technical and electronic
15 devices is not yet clear.

The present invention is, therefore ~~based on the object of, directed toward~~ proposing an alternative method for operating mobile terminals and a corresponding mobile radio system, it being possible to reliably control the use or non-use of mobile phones within the mobile radio system.

20 ~~This object is achieved according to the invention by means of a method having the features of claim 1 and/or by means of a mobile radio system having the features of claim 21. The subclaims respectively define preferred and advantageous embodiments of the present invention.~~

SUMMARY OF THE INVENTION

25 The present invention defines chronological and/or spatial non-use ranges which are monitored within the mobile radio system. The spatial non-use ranges can be defined both by the mobile radio subscriber himself himself/herself and by a corresponding point which has the non-use range. In contrast, chronological non-use ranges are generally prescribed only by the corresponding mobile radio subscriber, it being possible to connect these chronological non-use ranges, in particular, to the organizer of the mobile radio subscriber.
30

In order to monitor spatial non-use ranges, corresponding monitoring ~~means~~ measures are provided which sense the position of the corresponding mobile terminal, for example of a mobile phone, within the mobile radio network. These monitoring ~~means~~ measures can be connected, for example, to the GPS (Global Positioning System) system and thus ~~permits~~ permits positions to be determined by satellite. Likewise, the position of any mobile terminal can be determined in relation to the known geographic position of three base stations or ~~by means of~~ via cell identifiers (Cell Ids) using a triangulation method.

If it is detected within the mobile radio system, ~~by means of~~ via time monitoring or position monitoring of the mobile terminal, that one of the predefined non-use ranges has been reached, a corresponding non-use action, which is intended to ensure non-use of the respective mobile terminal, is automatically initiated. This action can be, for example, the automatic transmission of a message (for example, of an SMS (Short Message Services)) Services) to the mobile terminal, the activation of an automatic call forwarding facility or automatic switching off of the mobile terminal. It is recommended here to adapt the “severity” of the respectively selected action to the instantaneous distance from the respective non-use range, so that a mobile phone is, for example, forcibly switched off automatically only if the mobile phone is less than 10 m away from the corresponding non-use range.

The present invention thus permits both the passive request and an active request, i.e. self-selected by the mobile radio subscriber, for the non-use of the mobile terminal as a function of the instantaneous geographic position and/or time. The control of the non-use facility is always carried out within the respective mobile radio system in that corresponding measures are taken at the mobile terminal itself or via the network operator, i.e., no external or additional transmitters are provided and are thus not necessary either. In particular, the maintenance of a mobile radio system with comprehensive area coverage is ensured because, for example, the transmission power of the base station, etc., is not manipulated. Moreover, the “degree of severity” of the request not to use the mobile terminal can be adapted to the urgency of such a measure.

Additional features and advantages of the present invention are described in, and will be apparent from, the following Detailed Description of the Invention and the Figures.

BRIEF DESCRIPTION OF THE FIGURES

5 The invention is explained in more detail below with reference to the appended drawing and by means of preferred exemplary embodiments.

Fig. 1 shows a preferred block circuit diagram of an exemplary embodiment of the mobile radio system of the present invention, and,

10 Fig. 2 shows a flowchart of an exemplary embodiment of a method according to the present invention which can be applied in the mobile radio system shown in Fig. 1.

DETAILED DESCRIPTION OF THE INVENTION

Fig. 1 shows, in a way which is representative of a mobile radio system, a base station 1 and a mobile phone 2 which communicates with the latter over a 15 mobile radio channel 5. Modern mobile radio networks generally have a cellular structure, each radio cell being assigned a base station 1 which is responsible for the mobile phones 2 which are located within this radio cell at any given moment, and additionally serves as an interface to the telephone fixed network so that not only calls between different mobile phones 2 but also between a mobile phone 2 20 and a fixed network terminal (not shown) can be made.

A mobile radio system ~~comprises~~ includes a memory 4 in which chronological and/or spatial non-use ranges are stored for each mobile radio subscriber or mobile phone. These ranges are time periods or geographic ranges in which use of the corresponding mobile phone 2 is not desired.

25 These non-use ranges can be determined by each mobile radio subscriber himself himself/herself. This can be made, for example, ~~by means of~~ via an appropriate entry at the mobile phone 2 with subsequent transmission of the data to the network operator or the base station 1 or by signaling to the network operator or the service provider. When the information relating to the non-use ranges is 30 transmitted to the service provider, the latter collects the information relating to the non-use ranges of all the mobile phones 2 for which it is responsible and passes it

on to the network operator 1 or to the individual base stations 1 of the mobile radio network. Likewise, it is possible for specific geographic locations, for example hospitals, etc., in which use of mobile phones is not desired, to be defined to the service provider or network operator as non-use ranges by the locations themselves.

5 For this purpose, such locations must also signal their geographic data to the network operator or service provider in order to be able to be subsequently monitored.

As has already been mentioned, the non-use ranges can be seen not only in spatial but also in chronological terms. For example, a mobile radio subscriber 10 may be interested in receiving no calls between 8.00 p.m. and 10.00 p.m. In such a situation it is appropriate for the mobile radio subscriber to have an automatic adjustment facility for these chronological non-use ranges on his his/her organizers, so that the mobile radio subscriber cannot be disturbed by the calls during important meetings, for example.

15 While the monitoring of the chronological non-use ranges can be carried out relatively easily ~~by means of~~ via a time measuring ~~means~~ device, the monitoring of spatial non-use ranges is more complex because, to do this, the position of the mobile phone 2 always has to be sensed. For this purpose, according to ~~fig~~ Fig. 1, a corresponding device 3 is provided which senses the instantaneous position of the 20 mobile phone 2 with sufficient precision. The device 3 can be coupled, for example, to a GPS (Global Positioning System) system, by which corresponding information relating to the positions of the individual mobile phones 2 is supplied in the form of their geographic longitude and latitude. It is also conceivable for the device 3 to determine the position of the mobile phone 2 with respect to known 25 geographic reference points. For example, the position of the mobile phone 2 within the mobile radio network can be determined using a triangulation method with respect to the known position of three base stations 1 if, for example, the propagation time differences of a signal transmitted by the mobile phone 2 are evaluated with respect to the three base stations 1.

30 The non-use ranges stored in the memory 4 are monitored by a controller 6 with reference to the position data supplied by the device 3 and the instantaneous

time data, in order to determine a possible collision and, if appropriate, initiate a corresponding measure. If the owner of a mobile phone moves, for example, into the vicinity of a predefined non-use range, for example into the vicinity of a hospital or if ~~he~~ he/she is less than a specific minimum distance away from this
5 non-use range, ~~he~~ he/she is requested by the controller 6 not to use ~~his~~ the mobile phone 2. For such a “request”, various measures are conceivable. In the simplest case, only an appropriate message, which can be in the form of a SMS message or
by means of via a call with an automatic announcement, is automatically transmitted to the mobile unit 2. Likewise, it is possible to activate an automatic
10 call forwarding facility which ensures that incoming calls for the mobile phone 2 are automatically forwarded to another, assigned receiver; in particular, to a voicemail box or to a telephone answering machine. Furthermore it is conceivable, when a non-use range is reached, to replace the ringing of the mobile phone 2, in the event of a call, by vibration, for which purpose corresponding mechanisms are
15 already known. As a result, at least the suppression of disruptive ringing noises is avoided. Moreover, the user can be signaled optically, for example by flashing of ~~his~~ his/her radio clock etc., which also requires ~~him~~ him/her to switch off ~~his~~ the mobile phone 2. Finally, in the most extreme case, the mobile phone 2 can be switched off automatically by the mobile phone itself or via the network operator,
20 in which case it should be ensured, however, that an emergency call is still possible. In all cases, the measure taken is preferably cancelled again after the subscriber leaves the non-use range, so that unrestricted use of the mobile phone 2 is always possible outside the desired or predefined non-use ranges.

In order to avoid confusing the user, it is recommended that the owner of
25 the mobile phone 2 is always informed of the current state of ~~his~~ his/her device, which can be carried out, in particular ~~by means of~~, via an appropriate screen display (for example, “You are currently in a non-use range and your unit has been switched off”), so that the user can distinguish, in particular between automatic switching off when the non-use range is reached and an area of no radio coverage
30 or a time when his mobile phone 2 is defective or the battery is exhausted.

In principle it is also conceivable to configure the control device 6 in the form of what is referred to as a short range communication device which initiates respectively necessary action for the non-use of the mobile phone 2 by means of via an additional control signal or information signal transmitted to the mobile 5 phone 2. In order to avoid influencing the actual mobile radio network, this control information or information signal is transmitted here on a different wavelength from that of the actual mobile radio communication signal. This control signal or information signal can thus can, for example, be transmitted in a GSM mobile radio network in the form of a blue tooth signal or infrared signal and evaluated in the 10 mobile phone 2 by a correspondingly configured receiver.

In the example shown in fig Fig. 1, the devices 3, 4 and 6 are coupled to the base station 1 or assigned to the network operator. However, it is, of course, also conceivable for these units to be integrated into the mobile phone 2, in which case the memory 4 only stores the non-unit areas of the corresponding mobile phone 2. 15 Furthermore, in this case, each mobile phone 2 can automatically determine its geographic position by means of via a device 3 by virtue of the fact that the device 3 is configured, for example, as a GPS transceiver unit or evaluates, in terms of its propagation time differences, a signal which is emitted simultaneously by three base stations 1 with known geographic positions. When the devices 3, 4 and 6 are 20 integrated into the mobile phone 2, the controller 6 can then directly initiate the corresponding action for the non-use of the mobile phone on the same mobile phone 2.

It is particularly advantageous if the “severity” of the measure or action to be taken is adapted to the necessary urgency of the non-use of the mobile phone 2. 25 This will be explained in more detail below with reference to flowcharts shown in fig Fig. 2.

As has already been explained, the chronological and/or spatial non-use ranges are firstly defined by the owner of the mobile phone himself himself/herself or by a corresponding location and this information is collected (Step S100). 30 Whether these predefined non-use ranges are reached is then monitored (S101) automatically and continuously and a check is made to determine whether there is a

collision between the instantaneous time and the chronological non-use ranges or the instantaneous position of the mobile phone and the spatial non-use ranges (S102). This can be done, for example, by monitoring a relatively widely formulated limiting value for the time period between the instantaneous time and the individual chronological non-use ranges or the distance between the instantaneous position of the mobile phone and the individual spatial non-use ranges. If there is no risk of a collision, it is ensured that unrestricted use of the mobile phone is possible. If measures for the non-use of the mobile phone have previously been taken, they are cancelled again in this case (S103).

10 If, on the other hand, there is the risk of a collision with the predefined non-use ranges, a very tightly selected limiting value for the distance between the instantaneous time and the chronological non-use ranges or the instantaneous position and the spatial non-use ranges is firstly checked (S104). If there is, for example, only a time period of 10s between the instantaneous time and one of the 15 chronological non-use ranges or only a distance of 10m between the instantaneous position of the mobile phone and a spatial non-use range, a measure must be taken which reliably ensures that the mobile phone is used in the corresponding non-use range; i.e., forcible switching off of the mobile phone must be carried out (S108) which is not reversed again during the Step S103 until it is sensed that the 20 subscriber leaves the non-use range (S102). In a further Step S105, a further limiting value is monitored, which corresponds to a lower level of urgency with respect to the limiting value monitored in Step S104. In the example shown in fig 25 Fig. 2, it is checked here whether the time period between the instantaneous time and the chronological non-use ranges is shorter than 50s, or the distance between the instantaneous position of the mobile phone and the spatial non-use ranges is less than 50m. If this is the case, an automatic call divert, for example to a voicemail box of the corresponding mobile radio subscriber, is activated (S107). If these limiting values are not fulfilled either, a relatively “harmless” measure is taken which has the purpose of merely requesting the mobile radio subscriber not to 30 use his his/her mobile phone, this measure providing, for example, the transmission of a corresponding SMS message to the mobile phone (S106). The measures as

taken in Steps S106 and S107 are also not reversed in the Step S103 until it has been determined in Step S102 that there is no longer the risk of a collision with the predefined non-use ranges.

Patent Claims-Although the present invention has been described with reference to specific embodiments, those of skill in the art will recognize that changes may be made thereto without departing from the spirit and scope of the invention as set forth in the hereafter appended claims.

ABSTRACT OF THE DISCLOSURE

A method for operating a mobile terminal and corresponding mobile radio system, wherein chronological and/or spatial non-use ranges in which use of the mobile phone(2) is not desired are defined for the mobile phone(2). The mobile radio system continues to monitor whether the non-use ranges have been reached and, if appropriate, initiates an action for the non-use of the mobile phone(2). In the simplest case, a switch-off request is issued, and in the most extreme case automatic switching off of the mobile phone (2) occurs. In the case of spatial non-use ranges, the mobile radio system continuously monitors the position of the mobile phone (2) within the mobile radio system.

GR 99 P 2128

2/prb

Description

Method of operating a mobile terminal and corresponding mobile radio system

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The present invention relates to a method for operating a mobile terminal, in particular a mobile phone, in a mobile radio system, and to a corresponding mobile radio system.

10

The mobile phone has become a constant companion for many people, the essential advantage of mobile phones being that the respective mobile phone subscriber can be reached at any time.

15

However, being reachable at all times also has its disadvantages. In many locations in a mobile radio network the use of mobile phones is not desired. Thus, for example the use of a mobile phones in concert halls, cinemas, churches, restaurants, etc. is undesired, in particular the signaling sounds generated by the mobile phones when incoming calls are received being considered to be a nuisance. In other areas, for example in aircraft or hospitals, the use of mobile phones is even forbidden owing to the disadvantageous influence on the high-frequency-sensitive electronics. For this reason, mobile radio subscribers are requested verbally or by means of signs not to use their mobile phones in the corresponding areas. In some cases, the use of mobile phones is also forbidden by law.

However, for such provisions to be effective, it must be possible to rely on the decency and reliability of mobile radio subscribers or owners of mobile phones.

35 However, because mobile phone subscribers are frequently lacking in the necessary considerateness, possible ways

for automatically protecting specific locations against the disruptive use of the mobile phones have already been developed. For example, it is known to install jamming transmitters which intentionally prevent calls 5 being made with mobile phones in a specific area, for which purpose the jamming transmitters superimpose signals on the signals of incoming and outgoing calls. Furthermore, devices are also known which change the radio transmit power of the base stations of the mobile 10 radio network within a specific range, thus preventing contact or a connection setup between the mobile phones and the base station. Finally, it is also known to install small transmitters at the entrances to rooms in which the use of mobile phones is to be prevented, 15 which transmitters switch off any mobile phone by remote control using a corresponding radio signal when the subscriber passes the transmitter. When the subscriber leaves such rooms, the mobile phones are then switched on again by the transmitter.

20

However, mobile phone network operators are obliged to provide a mobile radio network with an area coverage that is as comprehensive as possible, but this is restricted by the measures described above; so that the 25 legal acceptability of such measures or devices is currently still under debate. In addition, the possible negative effects of such measures on technical and electronic devices is not yet clear.

30

The present invention is therefore based on the object of proposing an alternative method for operating mobile terminals and a corresponding mobile radio system, it being possible to reliably control the use or non-use of mobile phones within the mobile radio system.

This object is achieved according to the invention by means of a method having the features of claim 1 and/or by means of a mobile radio system having

the features of claim 21. The subclaims respectively define preferred and advantageous embodiments of the present invention.

5 The invention defines chronological and/or spatial non-use ranges which are monitored within the mobile radio system. The spatial non-use ranges can be defined both by the mobile radio subscriber himself and by a corresponding point which has the non-use range. In
10 contrast, chronological non-use ranges are generally prescribed only by the corresponding mobile radio subscriber, it being possible to connect these chronological non-use ranges in particular to the organizer of the mobile radio subscriber.

15 In order to monitor spatial non-use ranges, corresponding monitoring means are provided which sense the position of the corresponding mobile terminal, for example of a mobile phone, within the mobile radio network. These monitoring means can be connected, for example, to the GPS (Global Positioning System) system and thus permits positions to be determined by satellite. Likewise, the position of any mobile terminal can be determined in relation to the known
20 25 geographic position of three base stations or by means of cell identifiers (Cell Ids) using a triangulation method.

If it is detected within the mobile radio system, by
30 means of time monitoring or position monitoring of the mobile terminal, that one of the predefined non-use ranges has been reached, a corresponding non-use action, which is intended to ensure non-use of the respective mobile terminal, is automatically initiated.
35 This action can be, for example, the automatic transmission of a message (for example of an SMS (Short Message Services)) to the mobile terminal, the activation of an automatic

call forwarding facility or automatic switching off of the mobile terminal. It is recommended here to adapt the "severity" of the respectively selected action to the instantaneous distance from the respective non-use 5 range, so that a mobile phone is, for example, forcibly switched off automatically only if the mobile phone is less than 10 m away from the corresponding non-use range.

10 The present invention thus permits both the passive request and an active request, i.e. self-selected by the mobile radio subscriber, for the non-use of the mobile terminal as a function of the instantaneous geographic position and/or time. The control of the 15 non-use facility is always carried out within the respective mobile radio system in that corresponding measures are taken at the mobile terminal itself or via the network operator, i.e. no external or additional transmitters are provided and are thus not necessary 20 either. In particular, the maintenance of a mobile radio system with comprehensive area coverage is ensured because, for example, the transmission power of the base station, etc. is not manipulated. Moreover, the "degree of severity" of the request not to use the 25 mobile terminal can be adapted to the urgency of such a measure.

30 The invention is explained in more detail below with reference to the appended drawing and by means of preferred exemplary embodiments.

Fig. 1 shows a preferred block circuit diagram of an exemplary embodiment of the mobile radio system of the present invention, and

35

Fig. 2 shows a flowchart of an exemplary embodiment of a method according to the invention which can be applied in the mobile radio system shown in Fig. 1.

Fig. 1 shows, in a way which is representative of a mobile radio system, a base station 1 and a mobile phone 2 which communicates with the latter over a mobile radio channel 5. Modern mobile radio networks 5 generally have a cellular structure, each radio cell being assigned a base station 1 which is responsible for the mobile phones 2 which are located within this radio cell at any given moment, and additionally serves as an interface to the telephone fixed network so that 10 not only calls between different mobile phones 2 but also between a mobile phone 2 and a fixed network terminal (not shown) can be made.

A mobile radio system comprises a memory 4 in which 15 chronological and/or spatial non-use ranges are stored for each mobile radio subscriber or mobile phone. These ranges are time periods or geographic ranges in which use of the corresponding mobile phone 2 is not desired.

20 These non-use ranges can be determined by each mobile radio subscriber himself. This can be made, for example, by means of an appropriate entry at the mobile phone 2 with subsequent transmission of the data to the network operator or the base station 1 or by signaling 25 to the network operator or the service provider. When the information relating to the non-use ranges is transmitted to the service provider, the latter collects the information relating to the non-use ranges of all the mobile phones 2 for which it is responsible 30 and passes it on to the network operator 1 or to the individual base stations 1 of the mobile radio network. Likewise, it is possible for specific geographic locations, for example hospitals, etc. in which use of mobile phones is not desired, to be defined to the 35 service provider or network operator as non-use ranges by the locations themselves. For this purpose, such locations must also signal

their geographic data to the network operator or service provider in order to be able to be subsequently monitored.

5 As has already been mentioned, the non-use ranges can be seen not only in spatial but also in chronological terms. For example, a mobile radio subscriber may be interested in receiving no calls between 8.00 p.m. and 10.00 p.m. In such a situation it is appropriate for
10 the mobile radio subscriber to have an automatic adjustment facility for these chronological non-use ranges on his organizers, so that the mobile radio subscriber cannot be disturbed by the calls during important meetings, for example.

15 While the monitoring of the chronological non-use ranges can be carried out relatively easily by means of a time measuring means, the monitoring of spatial non-use ranges is more complex because, to do this, the
20 position of the mobile phone 2 always has to be sensed. For this purpose, according to fig. 1, a corresponding device 3 is provided which senses the instantaneous position of the mobile phone 2 with sufficient precision. The device 3 can be coupled, for example, to
25 a GPS (Global Positioning System) system, by which corresponding information relating to the positions of the individual mobile phones 2 is supplied in the form of their geographic longitude and latitude. It is also conceivable for the device 3 to determine the position
30 of the mobile phone 2 with respect to known geographic reference points. For example, the position of the mobile phone 2 within the mobile radio network can be determined using a triangulation method with respect to the known position of three base stations 1 if, for
35 example, the propagation time differences of a signal transmitted by the mobile phone 2 are evaluated with respect to the three base stations 1.

The non-use ranges stored in the memory 4 are monitored by a controller 6 with reference to the position data supplied by the device 3 and the instantaneous time data, in order to determine a possible collision and, 5 if appropriate, initiate a corresponding measure. If the owner of a mobile phone moves, for example, into the vicinity of a predefined non-use range, for example into the vicinity of a hospital or if he is less than a specific minimum distance away from this non-use range, 10 he is requested by the controller 6 not to use his mobile phone 2. For such a "request", various measures are conceivable. In the simplest case, only an appropriate message, which can be in the form of a SMS message or by means of a call with an automatic 15 announcement, is automatically transmitted to the mobile unit 2. Likewise, it is possible to activate an automatic call forwarding facility which ensures that incoming calls for the mobile phone 2 are automatically forwarded to another, assigned receiver, in particular 20 to a voicemail box or to a telephone answering machine. Furthermore it is conceivable, when a non-use range is reached, to replace the ringing of the mobile phone 2, in the event of a call, by vibration, for which purpose corresponding mechanisms are already known. As a result 25 at least the suppression of disruptive ringing noises is avoided. Moreover, the user can be signaled optically, for example by flashing of his radio clock etc., which also requires him to switch off his mobile phone 2. Finally, in the most extreme case, the mobile 30 phone 2 can be switched off automatically by the mobile phone itself or via the network operator, in which case it should be ensured, however, that an emergency call is still possible. In all cases, the measure taken is preferably cancelled again after the subscriber leaves 35 the non-use range, so that

unrestricted use of the mobile phone 2 is always possible outside the desired or predefined non-use ranges.

5 In order to avoid confusing the user, it is recommended that the owner of the mobile phone 2 is always informed of the current state of his device, which can be carried out in particular by means of an appropriate screen display (for example "You are currently in a 10 non-use range and your unit has been switched off"), so that the user can distinguish, in particular between automatic switching off when the non-use range is reached and an area of no radio coverage or a time when his mobile phone 2 is defective or the battery is 15 exhausted.

In principle it is also conceivable to configure the control device 6 in the form of what is referred to as a short range communication device which initiates 20 respectively necessary action for the non-use of the mobile phone 2 by means of an additional control signal or information signal transmitted to the mobile phone 2. In order to avoid influencing the actual mobile 25 radio network, this control information or information signal is transmitted here on a different wavelength from that of the actual mobile radio communication signal. This control signal or information signal can thus, for example, be transmitted in a GSM mobile radio network in the form of a blue tooth signal or infrared 30 signal and evaluated in the mobile phone 2 by a correspondingly configured receiver.

In the example shown in fig. 1, the devices 3, 4 and 6 are coupled to the base station 1 or assigned to the 35 network operator. However, it is, of course, also conceivable for these units to be integrated into the mobile phone 2, in which case the memory 4 only stores

the non-unit areas of the corresponding mobile phone 2. Furthermore, in this case, each mobile phone 2 can automatically determine its geographic position by means of a device 3 by virtue of the fact that the

device 3 is configured, for example, as a GPS transceiver unit or evaluates, in terms of its propagation time differences, a signal which is emitted simultaneously by three base stations 1 with known 5 geographic positions. When the devices 3, 4 and 6 are integrated into the mobile phone 2, the controller 6 can then directly initiate the corresponding action for the non-use of the mobile phone on the same mobile phone 2.

10

It is particularly advantageous if the "severity" of the measure or action to be taken is adapted to the necessary urgency of the non-use of the mobile phone 2. This will be explained in more detail below with 15 reference to flowcharts shown in fig. 2.

As has already been explained, the chronological and/or spatial non-use ranges are firstly defined by the owner of the mobile phone himself or by a corresponding 20 location and this information is collected (Step S100). Whether these predefined non-use ranges are reached is then monitored (S101) automatically and continuously and a check is made to determine whether there is a collision between the instantaneous time and the 25 chronological non-use ranges or the instantaneous position of the mobile phone and the spatial non-use ranges (S102). This can be done, for example, by monitoring a relatively widely formulated limiting value for the time period between the instantaneous 30 time and the individual chronological non-use ranges or the distance between the instantaneous position of the mobile phone and the individual spatial non-use ranges. If there is no risk of a collision, it is ensured that 35 unrestricted use of the mobile phone is possible. If measures for the non-use of the mobile phone have previously

been taken, they are cancelled again in this case (S103).

If, on the other hand, there is the risk of a collision with the predefined non-use ranges, a very tightly selected limiting value for the distance between the instantaneous time and the chronological non-use ranges or the instantaneous position and the spatial non-use ranges is firstly checked (S104). If there is, for example, only a time period of 10s between the instantaneous time and one of the chronological non-use ranges or only a distance of 10m between the instantaneous position of the mobile phone and a spatial non-use range, a measure must be taken which reliably ensures that the mobile phone is used in the corresponding non-use range, i.e. forcible switching off of the mobile phone must be carried out (S108) which is not reversed again during the Step S103 until it is sensed that the subscriber leaves the non-use range (S102). In a further Step S105, a further limiting value is monitored, which corresponds to a lower level of urgency with respect to the limiting value monitored in Step S104. In the example shown in fig. 2, it is checked here whether the time period between the instantaneous time and the chronological non-use ranges is shorter than 50s, or the distance between the instantaneous position of the mobile phone and the spatial non-use ranges is less than 50m. If this is the case, an automatic call divert, for example to a voicemail box of the corresponding mobile radio subscriber, is activated (S107). If these limiting values are not fulfilled either, a relatively "harmless" measure is taken which has the purpose of merely requesting the mobile radio subscriber not to use his mobile phone, this measure providing, for example, the transmission of a corresponding SMS message to the mobile phone (S106). The measures as taken in Steps S106 and S107

are also not reversed in the Step S103 until it has been determined in Step S102 that there is no longer the risk of a collision with the predefined non-use ranges.

14-08-2001

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Patent claims (Good copy)

1. A method for operating a mobile terminal in a mobile radio system, at least one non-use range being defined in which use of the mobile terminal (2) is not desired, it being monitored within the mobile radio system whether the non-use range is reached, and an being initiated within the mobile radio system if the non-use range has been reached, characterized in that a chronological period is defined as the non-use range, the action for the non-use of the mobile terminal (2) being initiated within the mobile radio system independently of the current location of the mobile terminal (2).
2. The method as claimed in claim 1, characterized in that the subscriber to the mobile radio system who is assigned to the mobile terminal (2) defines himself the non-use range and signals it to the mobile radio system or to a corresponding mobile radio service provider.
3. The method as claimed in one of the preceding claims, characterized in that a message to the mobile terminal (2) which requests the subscriber assigned to the mobile terminal (2) to switch off mobile terminal (2) is transmitted automatically as an action for the non-use of the mobile terminal (2) in the mobile radio system.
4. The method as claimed in claim 3, characterized in that

the message is transmitted to the mobile terminal (2) in the form of a short message, the short message being represented on a display of the mobile terminal (2).

5

5. The method as claimed in claim 3, characterized in that the message is transmitted in the form of a call to the mobile terminal (2).

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6. The method as claimed in one of the preceding claims, characterized in that a call forwarding facility, which automatically forwards calls for the mobile terminal (2) to a receiver assigned to the mobile terminal (2), is actuated in the mobile radio system at an action for the non-use of the mobile terminal (2).

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7. The method as claimed in one of the preceding claims, characterized in that the method of signaling a call to the mobile terminal (2) is used as a action for the non-use of the mobile terminal (2).

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8. The method as claimed in one of the preceding claims, characterized in that an appropriate optical signal is transmitted from the mobile radio system to the subscriber to the mobile radio system, which is assigned to the mobile terminal (2), as an action for the non-use of the mobile terminal (2).

35

9. The method as claimed in one of the preceding claims, characterized in that the mobile terminal (2) is automatically deactivated within the mobile radio system as an action for the non-use of the mobile terminal (2).

10. The method as claimed in one of the preceding claims,

5 characterized in that a specific action of a plurality of available actions for the non-use of the mobile terminal (2) is automatically selected and initiated as a function of the instantaneous distance from the non-use range, the severity of the selected action increasing as the distance from the non-use range decreases.

10 11. The method as claimed in one of the preceding claims, characterized in that, after the initiation of an action for the non-use of the mobile terminal (2), a corresponding message, which provides information on the instantaneous operating state of the mobile terminal (2), is automatically displayed on a display of the mobile terminal (2).

15 12. The method as claimed in one of the preceding claims, characterized in that the initiated action for the non-use of the mobile terminal (2) is reversed if the mobile terminal (2) leaves the non-use range again.

20 13. A mobile radio system having at least one base station (1) and at least one mobile terminal (2) between which communication information is transmitted via a mobile radio channel (5), at least one non-use range being defined in which use of the mobile terminal (2) is not desired, the mobile radio system comprising control means (3, 25 4, 6) for monitoring whether the non-use range is reached, the control means (3, 4, 6) being configured in such a way that they initiate an action for the non-use of the mobile terminal (2) if the non-use range has been reached, 30 characterized in that

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a chronological period is defined as the non-use range, an action for the non-use of the mobile terminal (2) being initiated independently of the current location of the mobile terminal (2) if the non-use range has been reached.

10 14. The mobile radio system as claimed in claim 13,
characterized in that the control means (3, 4, 6)
are assigned to the base station (1) of the mobile
radio system.

15 15. The mobile radio system as claimed in claim 13,
characterized in that the control means (3, 4, 6)
are integrated into the mobile terminal (2).

16. The mobile radio system as claimed in claim 13,
characterized in that the control means (3, 4, 6)
are assigned to a mobile radio service provider.

20 17. The mobile radio system as claimed in one of
claims 13-17, characterized in that the control
means (3, 4, 6) are configured to carry out the
method as claimed in one claims 1-12.

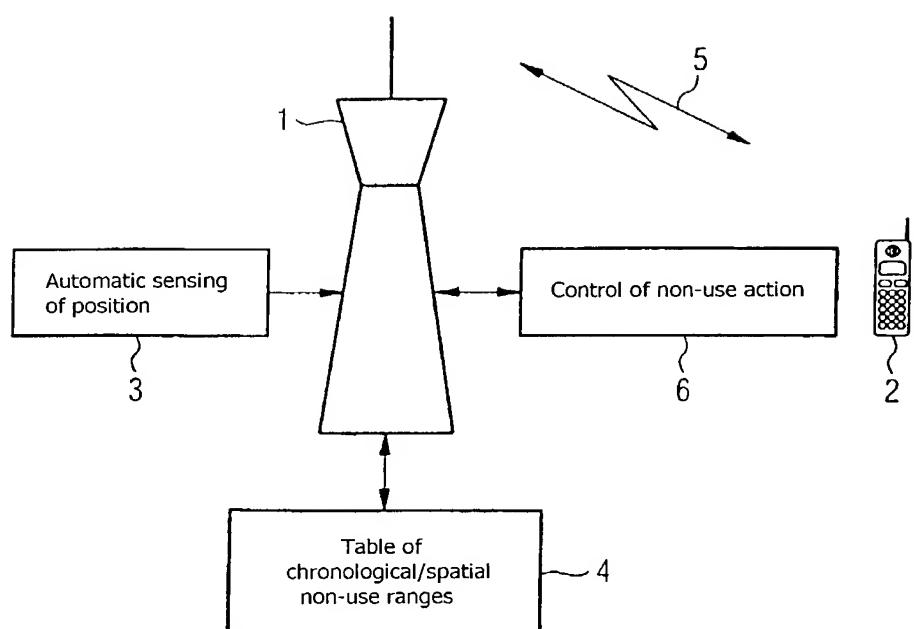
Abstract

Method for operating a mobile terminal and corresponding mobile radio system

Chronological and/or spatial non-use ranges in which use of the mobile phone(2) is not desired are defined for mobile phone (2). The mobile radio system continues to monitor whether the non-use ranges have been reached and, if appropriate, initiates an action for the non-use of the mobile phone (2). In the simplest case, a switch-off request is issued, and in the most extreme case automatic switching off of the mobile phone (2) occurs. In the case of spatial non-use ranges, the mobile radio system continuously monitors the position of the mobile phone (2) within the mobile radio system.

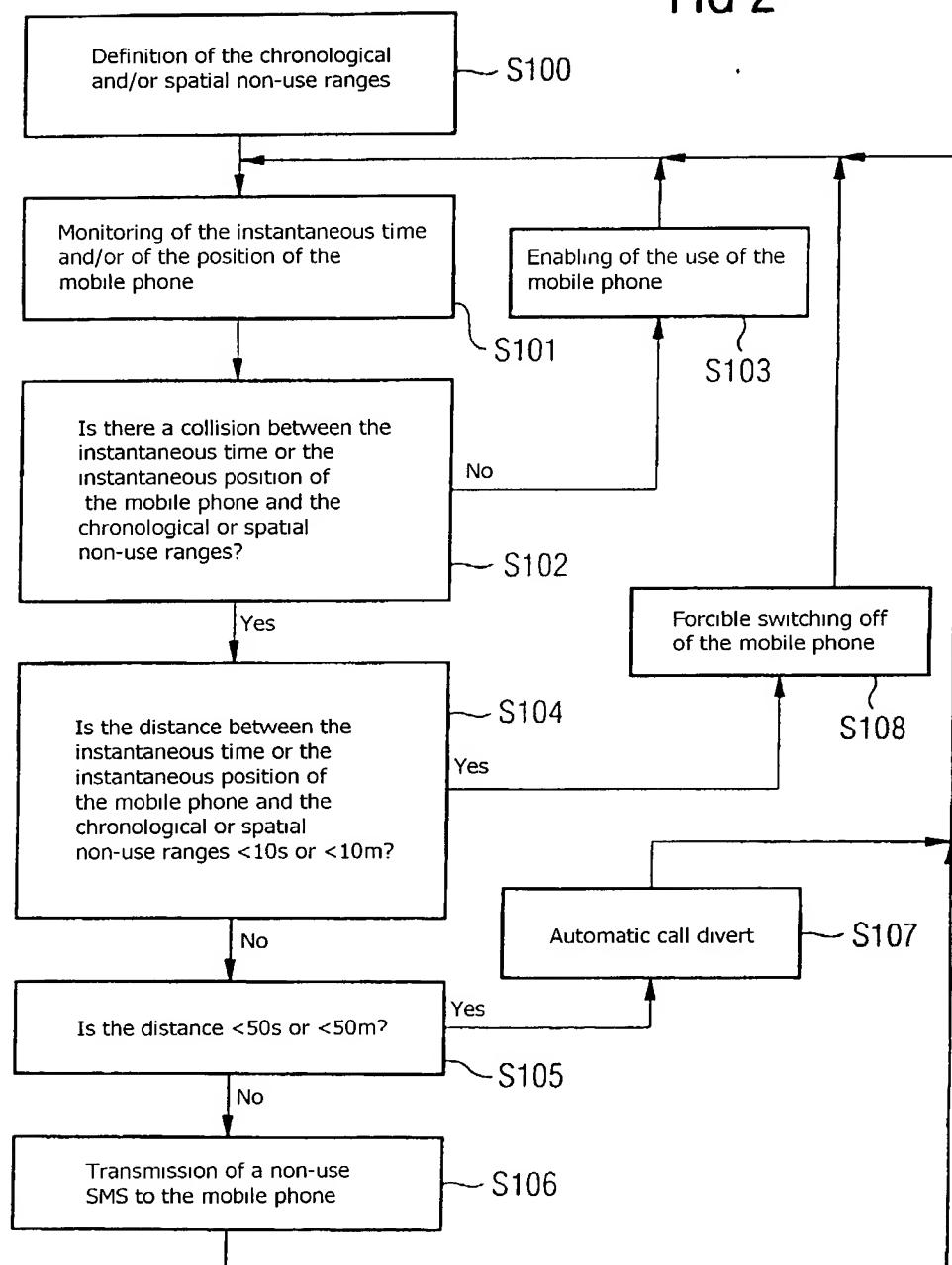
(Fig. 1)

FIG 1



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FIG 2



Declaration and Power of Attorney For Patent Application
Erklärung Für Patentanmeldungen Mit Vollmacht
German Language Declaration

Als nachstehend benannter Erfinder erkläre ich hiermit an Eides Statt:

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Verfahren zum Betreiben eines mobilen Endgerätes und entsprechendes Mobilfunksystem

deren Beschreibung

(zutreffendes ankreuzen)

hier beigefügt ist.

am 14.04.2000 als

PCT internationale Anmeldung

PCT Anmeldungsnummer PCT/DE00/01174

eingereicht wurde und am _____ abgeändert wurde (falls tatsächlich abgeändert).

Ich bestätige hiermit, dass ich den Inhalt der obigen Patentanmeldung einschließlich der Ansprüche durchgesehen und verstanden habe, die eventuell durch einen Zusatzantrag wie oben erwähnt abgeändert wurde.

Ich erkenne meine Pflicht zur Offenbarung irgendwelcher Informationen, die für die Prüfung der vorliegenden Anmeldung in Einklang mit Absatz 37, Bundesgesetzbuch, Paragraph 1.56(a) von Wichtigkeit sind, an.

Ich beanspruche hiermit ausländische Prioritätsvorteile gemäß Abschnitt 35 der Zivilprozeßordnung der Vereinigten Staaten, Paragraph 119 aller unten angegebenen Auslandsanmeldungen für ein Patent oder eine Erfindersurkunde, und habe auch alle Auslandsanmeldungen für ein Patent oder eine Erfindersurkunde nachstehend gekennzeichnet, die ein Anmelde- datum haben, das vor dem Anmelde- datum der Anmeldung liegt, für die Priorität beansprucht wird.

As a below named inventor, I hereby declare that:

My residence, post office address and citizenship are as stated below next to my name,

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled

Method for operating a mobile terminal and a corresponding mobile radio system

the specification of which

(check one)

is attached hereto.

was filed on 14.04.2000 as

PCT international application

PCT Application No. PCT/DE00/01174

and was amended on _____ (if applicable)

I hereby state that I have reviewed and understand the contents of the above identified specification, including the claims as amended by any amendment referred to above.

I acknowledge the duty to disclose information which is material to the examination of this application in accordance with Title 37, Code of Federal Regulations, §1.56(a).

I hereby claim foreign priority benefits under Title 35, United States Code, §119 of any foreign application(s) for patent or inventor's certificate listed below and have also identified below any foreign application for patent or inventor's certificate having a filing date before that of the application on which priority is claimed:

German Language Declaration

Prior foreign applications Priorität beansprucht

Priority Claimed

19929669.3 DE
(Number) (Country)
(Nummer) (Land)

28.06.1999
(Day Month Year Filed)
(Tag Monat Jahr eingereicht)

Yes No
 Ja Nein

(Number) (Country)
(Nummer) (Land)

(Day Month Year Filed)
(Tag Monat Jahr eingereicht)

Yes No
 Ja Nein

(Number) (Country)
(Nummer) (Land)

(Day Month Year Filed)
(Tag Monat Jahr eingereicht)

Yes No
Ja Nein

Ich beanspruche hiermit gemäss Absatz 35 der Zivilprozessordnung der Vereinigten Staaten, Paragraph 120, den Vorzug aller unten aufgeführten Anmeldungen und falls der Gegenstand aus jedem Anspruch dieser Anmeldung nicht in einer früheren amerikanischen Patentanmeldung laut dem ersten Paragraphen des Absatzes 35 der Zivilprozeßordnung der Vereinigten Staaten, Paragraph 122 offenbart ist, erkenne ich gemäss Absatz 37, Bundesgesetzbuch, Paragraph 1.56(a) meine Pflicht zur Offenbarung von Informationen an, die zwischen dem Anmelde datum der früheren Anmeldung und dem nationalen oder PCT internationalen Anmelde datum dieser Anmeldung bekannt geworden sind.

I hereby claim the benefit under Title 35, United States Code, §120 of any United States application(s) listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States application in the manner provided by the first paragraph of Title 35, United States Code, §122, I acknowledge the duty to disclose material information as defined in Title 37, Code of Federal Regulations, §1.56(a) which occurred between the filing date of the prior application and the national or PCT international filing date of this application.

PCT/DE00/01174
(Application Serial No.)
(Anmeldeseriennummer)

14.04.2000
(Filing Date D, M, Y)
(Anmeldedatum T, M, J)

anhängig
(Status)
(patentiert, anhängig,
aufgegeben)

pending
(Status)
(patented, pending,
abandoned)

(Application Serial No.)
(Anmeldeseriennummer)

(Filing Date D,M,Y)
(Anmeldedatum T, M; J)

(Status)
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German Language Declaration

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